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STEERING SKI FOR SNOWMOBILES AND THE LIKE

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STEERING SKI FOR SNOWMOBILES AND THE LIKEABSTRACT OF THE DISCLOSURE

A ski for snowmobiles and the like comprising a ski runner and a keel member resiliently mounted at one end to the runner and pivotally connected at the other end to the runner. In the illustrated construction, parallel longitudinally extending slots are provided in the runner, and the keel member is channel-shaped to provide spaced-apart depending blades which are vertically movable within the slots. The blade edges normally are below the under surface of the runner, and the blades are moved vertically to place the blade edges flush with the runner under surface when an obstruction is encountered.

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BACKGROUND OF THE INVENTION

This invention relates to skis and, more particularly, to skis for use with snowmobiles and the like for steering the same.

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One area of use of the present invention is with snowmobiles, although the principles of the invention can be variously applied to other vehicles such as sleds which travel on snow and ice. Snowmobiles are provided with skis which rely on the frictional adhesion of the ski with the snow or ice surface for steering purposes. Some of these skis are provided with a blade or rib secured to the under surface of the ski to function as a keel and enhance the steering. When the keel encounters a rock or similar obstruction often hidden just beneath the surface of the ice or snow, damage to the ski or snowmobile or even an accident can occur. Even very small obstructions if encountered repeatedly can wear down the blade prematurely.

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SUMMARY OF THE INVENTION

It is, therefore, an object of the present invention to provide a steering ski for snowmobiles and the like including a keel member which is movable to avoid interference from obstructions.

It is a further object of the present invention to provide such a steering ski wherein the keel member has an improved gripping action with the snow or ice surface.



1 The present invention provides a ski for snowmobiles and
the like comprising a ski runner and a keel member resiliently
mounted at one end to the runner and pivotally connected at
the other end to the runner. The keel member blade edge
normally is below the under surface of the runner, and the
keel member is moved vertically to place the blade edge flush
with the runner under surface when an obstruction is
encountered. The runner can have parallel longitudinally
extending slots and the keel member can be channel-shaped
10 to provide spaced apart depending blades which are vertically
movable within the slots.

The foregoing and additional advantages and characterizing
features of the present invention will become clearly apparent
upon a reading of the ensuing detailed description together
with the including drawing wherein:

BRIEF DESCRIPTION OF THE DRAWING FIGURES

Fig. 1 is a fragmentary elevational view of a steering
ski according to the present invention as it would appear
in use with a snowmobile;

20 Fig. 2 is a fragmentary plan view of the steering ski
shown in Fig. 1;

Fig. 3 is a sectional view taken about on line 3-3 in
Fig. 2; and

Fig. 4 is a sectional view taken about on line 4-4 in
Fig. 2.

1 DETAILED DESCRIPTION OF THE ILLUSTRATED EMBODIMENT

Fig. 1 shows a steering ski, designated generally at 10, as it would appear in use with a snowmobile, a portion of the body of which is indicated at 11. In particular, ski 10 is positioned and attached beneath snowmobile 11, and a generally curved connecting member 12 in the form of a spring is connected at opposite ends thereof to longitudinally-spaced points on ski 10. One end of member 12 is fixedly connected through a bracket 13 to ski 10, and the other end 10 is slidably connected to ski 10 by a strap-like member 14. Member 12, in turn, is connected to a member shown generally at 15 mounted on the under side of snowmobile body 11, and operatively connected to the steering wheel of the snowmobile. The construction and operation of member 12, and the steering arrangement connected to member 15, form no part of the present invention but are believed to be well known to those skilled in the art so that a detailed description thereof is deemed to be unnecessary. In addition, an identical steering ski and connecting arrangement would be provided alongside 20 and parallel to the steering ski shown at 10 in Fig. 1.

Steering ski 10 according to the present invention comprises a ski runner 20 which in this illustration includes an upturned portion 21 at one end thereof. When ski 10 is attached to the snowmobile, upturned end 21 is disposed toward the front end thereof. First and second longitudinally extending

1 slots 23 and 24, respectively, are provided in runner 20 as shown in Fig. 2. Slots 23, 24 are contiguous in length, are mutually parallel with each other and with the longitudinal axis of runner 20, and spaced apart a suitable distance measured in a direction perpendicular to the axis of runner 20. In addition, slots 23, 24 are located in the region of runner 20 substantially in the middle relative to the ends thereof. Slots 23, 24 each are of a length less than half the length of runner 20.

10 Steering ski 10 according to the present invention further comprises a keel member 25 including a base portion, as shown in Fig. 4, and a pair of spaced apart, depending blade members 27 and 28. When keel member 25 is in assembled position, the base is disposed in a generally horizontal plane, and blade members 27, 28 each are disposed in a corresponding vertical plane and each extends at substantially a right angle to the base. Keel member 25, in addition, is positioned so that blades 27, 28 extend through and are vertically movable in slots 23 and 24, respectively. In preferred form, blade 27 is provided with an edge 29 which is arcuate or curved and, similarly, blade 28 is provided with an arcuate or curved edge 30.

1 Steering ski 10 according to the present invention further comprises means connected to runner 20 and to keel member 25 for pivotally connecting keel 25 at one end to runner 20 and for resiliently connecting keel 25 at the other end to runner 20. Referring to Figs. 1 and 3, one end of keel member 25 is pivotally connected to runner 20 by means comprising a pair of generally L-shaped bracket members 35, 26. Bracket members 35, 26 are secured to the upper surface of runner 20 by means such as screws 37, and are positioned near the ends of slots 23, 24 nearest upturned end 21 of runner 20. In addition, brackets 35, 36 are located in alignment with each other along a line perpendicular to the longitudinal axis of runner 20, and are spaced apart a sufficient distance so that slots 23, 24 are located between the vertical or upstanding portions of brackets 35, 36. A pin or shaft member 38 extends through projecting portions of keel member 25 coplanar with blade members 27, 28 at one end of keel 25 and through the vertical or upstanding portions of brackets 35, 36. Shaft 38 is disposed so that the axis thereof is perpendicular to longitudinal axis 20 of member 20. As a result, keel 25 is pivotally mounted through pin 38 and bracket 35, 36 to runner 20.

1 Keel 25 is resiliently connected to runner 20 by means including a generally channel-shaped member 40 having a base portion 41, a pair of legs 42, 43 each extending from base 41 at substantially a right angle thereto, and a pair of arm or tab members 44, 45 which extend outwardly and in opposite directions and at substantially right angles to legs 42, 43. The distance between legs 42 and 43 is greater than the distance between the corresponding outer edges of slots 23, 24. Channel member 40 is assembled on runner 20 so that base 41 lies in

10 a generally horizontal plane and so that member 40 is positioned over the end of keel 25. Member 40 is secured to runner 20 by means such as screws 46 extending into the upper surface of runner 20. A compression spring 48 is located between channel member 40 and keel 25. In particular, one end of compression spring 48 is secured or attached to the undersurface of the channel base portion 41. The other end of spring 30 is suitably attached to the upper surface of the keel base portion. As a result, keel 25 is tensioned whereby blade members 27, 28 normally extend through slots 23, 24 and

20 depend below the under surface or operative surface of runner 20.

1 Ski 10 according to the present invention is assembled under a snowmobile as shown in Fig. 1, it being noted that two skis are so assembled as previously described. In particular, the end of keel 25 which is pivotally mounted to runner 20 is nearest what would be the front end of the snowmobile. Accordingly, the end of keel 25 which is resiliently connected or mounted to runner 20 is located nearest the rear end of the snowmobile. In addition, keel member 25, and accordingly, blades 27, 28, is located in the central or middle region of runner 20 and has a total length less than one-half the length of runner 20. According to the present illustration the length of keel 25 is approximately one third that of the runner 20.

10 In operation, as the snowmobile travels over the snow or ice surface, blades 27, 29 normally extend below the under surface or operative surface of runner 20 to enhance the steering provided by ski 10. Blades 27, 29 are always under tension to allow ski 10 to give a positive steering action at all times. The fact that keel 25 is provided with spaced 20 apart, parallel depending blades 27, 28 increases the steering capability of ski 10. In addition, this is accomplished with blades which are relatively shorter in length than many heretofore available.

1 As the snowmobile travels along the snow or ice surface with blades 27, 29 fully extended below the surface of runner 20, if a rock or similar obstruction is encountered, it forces keel 25 upwardly so that the edges 29 and 30 of blades 27 and 28, respectively, are moved to a position flush with the under surface of runner 20. This provides at least two desirable results. In the first place the impact is cushioned thereby reducing or eliminating any damage to the snowmobile or discomfort or injury to the rider. Secondly, the wear on blades 27, 28 is reduced.

10 Accordingly, the present invention accomplishes its intended objects. While a single specific embodiment of the present invention has been described in detail, this has been done by way of illustration without thought of limitation.

1 The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A ski for snowmobiles and the like comprising:
 - a) a ski runner;
 - b) first and second longitudinally extending slots provided in said runner;
 - c) a keel member including first and second depending blade members vertically movable in said first and second slots, respectively; and
 - d) means connected to said runner and to said keel member for pivotally connecting said keel at one end to said runner and for resiliently connecting said keel at the other end to said runner;
 - e) whereby the edges of said blade members normally are below the under surface of said runner and said blade members are moved vertically in said slots when an obstruction is contacted to a position where the edges of said blade members are flush with the under surface of said runner.
- 20 2. Apparatus according to claim 1 wherein said edges of said blade members are arcuate.
3. Apparatus according to claim 1 wherein said keel member has a length less than one-half the length of said runner.

1 4. Apparatus according to claim 1 wherein said keel member is located along said runner at about the central or middle portion between the ends thereof.

5. Apparatus according to claim 1 wherein said keel member is pivotally mounted at the end thereof nearest the front of said ski and resiliently mounted at the end thereof nearest the rear end of said ski.

10 6. Apparatus according to claim 1 wherein said keel member includes a base portion above the upper surface of said runner and wherein said blade members depend from said base portion.

7. Apparatus according to claim 6 wherein said blade members are disposed each at substantially a right angle to said keel member base portion.

8. Apparatus according to claim 1 wherein said blade members depend from a keel base portion above the upper surface of said runner and wherein said means connected to said runner comprises:

20 a) a generally channel shaped member mounted on said runner near one end of said keel whereby the web or base portion of said channel member is spaced from said keel base portion;

- b) a spring located between said channel member base portion and said keel base portion for urging said blade members to a fully extended position where the edges thereof are below the under surface of said runner;
- c) a pair of bracket members each mounted on said runner and positioned near the other end of said keel member and on opposite sides thereof; and
- d) a shaft pivotally connected to said blade members and supported in said bracket members.

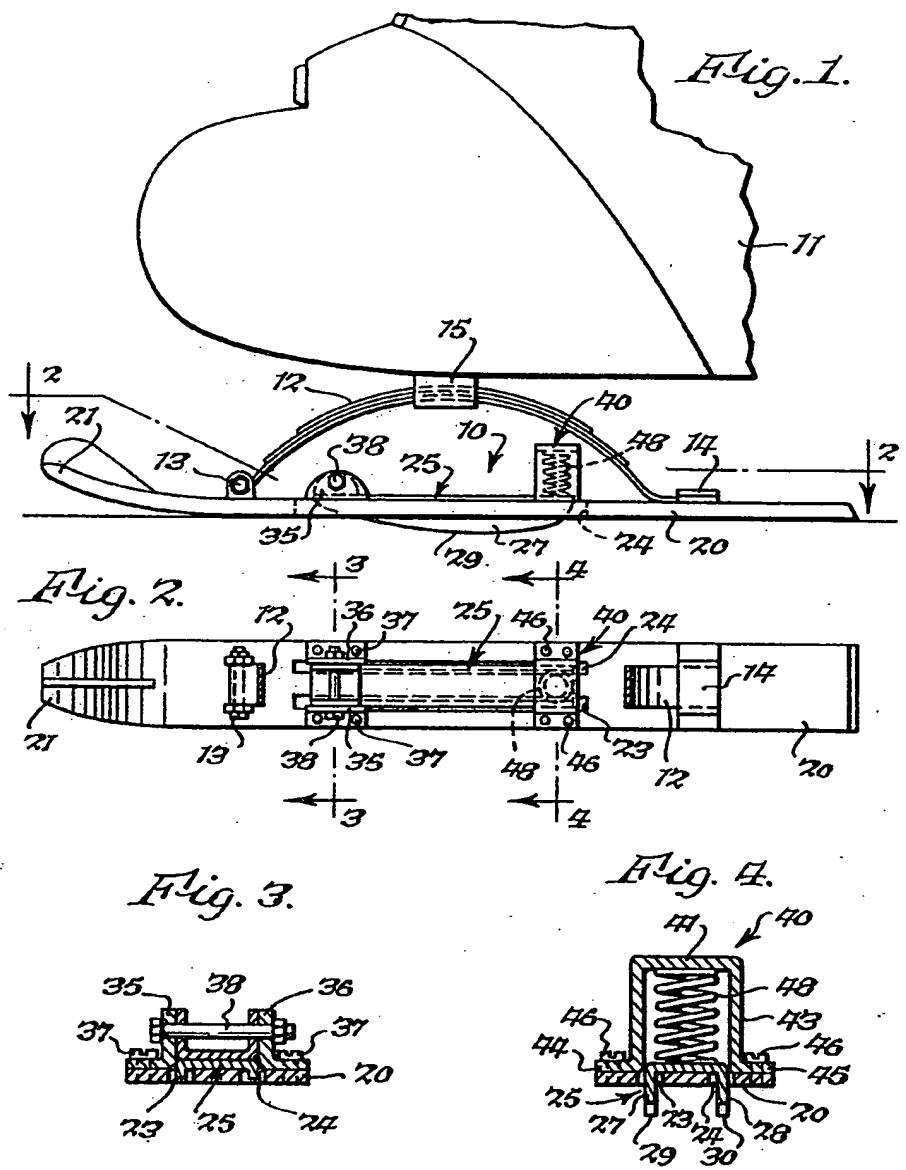
9. Apparatus according to claim 8 wherein said channel member and said spring are located on said runner nearest the rear end thereof and said bracket members and said shaft are located on said runner nearest the front end thereof.

10. A ski for snowmobiles and the like comprising:

- a) a ski runner adapted to be connected to a snowmobile for supporting and steering the same, said runner being provided with first and second longitudinally extending slots;
- b) a bladed keel member pivotally connected at one end thereof to said runner, said keel member including first and second depending blade members vertically movable in said first and second slots, respectively; and
- c) means connected at the other end of said runner and to said keel for resiliently connecting said other end of said keel member to said runner;
- d) whereby the bladed portion of said keel member normally is below the under surface of said runner and is moved vertically when an obstruction is contacted to a position flush with the under surface of said runner.

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11. Apparatus according to claim 1 wherein said slots extend along said runner in spaced apart and substantially parallel relation.



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